

THE DENTAL PRACTITIONER

A monthly journal for the Practitioner and his Staff

OF MEDICINE

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VOL. III, NO. 4

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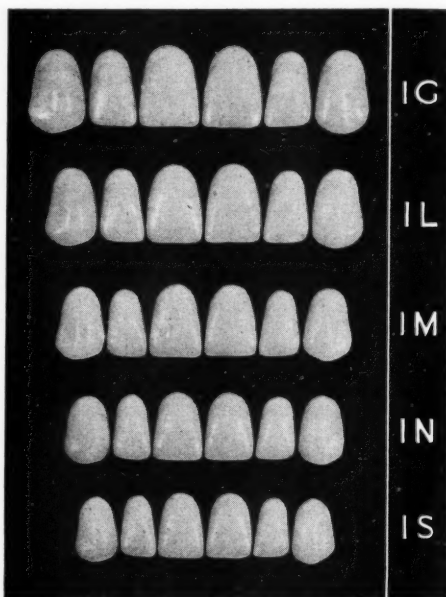
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THE DENTAL PRACTITIONER

A Monthly Journal for the Practitioner and his Staff

*(Incorporating the Proceedings of the British Society of Periodontology
and the Official Supplement of the S.I.M.A.—Dental Laboratories Section)*

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THE DENTAL PRACTITIONER

A Monthly Journal for the Practitioner and his Staff

Vol. III, No. 4

December, 1952



EDITORIAL

PREVENTIVE DENTISTRY

THE total number of articles written in the dental press over the last fifty or sixty years on the prevention of dental caries must now be approaching a thousand. Dozens of theories have been advanced, only to be demolished on investigation, and one wonders just how much nearer the heart of the problem we are after all this time. "Politicians", said Mr. Boyd-Carpenter, the Financial Secretary to the Treasury, "use statistics rather as a drunken man uses a lamp-post, more for support than illumination". This epigram can apply to the dental profession equally as well as to politicians, and indeed to most professions. Statistics are applied to dentistry in reviewing controlled experiments, and we must ask just how controlled are all these experiments. The number of variables increases with each experiment, particularly when performing mass experiments with schoolchildren. Any patient who has gross caries and asks a dentist for advice may be told of very many methods to help reduce the ravages of the disease. But all advice will commence with better oral hygiene, together with a talk on the effects of drugs. One of these chemicals will almost certainly be fluorine. A tremendous amount of literature has been published on fluorine, but are we

really in possession of enough facts (from statistics) to justify the forced experiment on the population that is now advocated? If a community suffers from mottled teeth does this arise solely from the effects of a high fluorine content in the water-supply? What is the exact amount of fluorine taken by these patients per day? This should include all solids and liquids. In a high fluorine area do the animals have a high fluorine content in their eggs and milk, and do the vegetables grown and eaten in the district have a high fluorine content? Far more research and evidence is required on this subject. It is doubtful if we have the moral right to force a community to undergo a vast experiment before the outcome is known. Too many people interpret the findings of fluorine study as a panacea for dental caries, when in actual fact the evidence is lacking. It is in fact still a theory.



The Editors and Publishers take this opportunity of wishing all their readers a very Happy Christmas, and increasing success and prosperity in the New Year.

DENTAL TREATMENT DURING PREGNANCY

By ARTHUR J. FREESE, F.R.C.S., L.D.S.

(Senior Registrar, London Hospital Dental Department)

A NUMBER of problems arise during the treatment of pregnant patients.

It will be convenient to begin by giving a brief summary of pregnancy, stressing the features which have a bearing on treatment.

The first symptom to be noticed by the mother is, of course, the absence of menstruation. It is customary to date the duration of the pregnancy from the first day of the last normal period. About two weeks later (that is, at the sixth week of pregnancy) most women begin to experience the "morning sickness". This may vary from a mild nausea to a fairly persistent vomiting occurring sometimes for a considerable part of the day. Some women do not experience this unpleasant symptom. A less widely known but fairly common symptom which accompanies the morning sickness is an excessive salivation accompanied by an unpleasant taste. The fertilized ovum at first lies free in the genital tract, and the first cell subdivisions take place while it is in the free state. Within a short while it embeds itself in the inner layers of the uterine wall, obtaining nourishment for itself from the tissue fluids of its parent. Gradually the foetus itself develops a circulatory system attached by the cord to a differentiated mass of cells—the placenta. This in turn is attached to the uterine wall of the parent. Thus the vascular system of the foetus is separated from the maternal circulation by thin layers of cells, and gaseous and nutritive exchanges can take place. The change-over to this system of nutrition takes place approximately at ten to twelve weeks. This change is of great practical importance because it marks an increase in the stability of the pregnancy.

Authorities estimate that 1 in 5 pregnancies terminate in miscarriage.

The great majority of these occur in the first twelve weeks of pregnancy, usually during the third month. It is impossible to estimate what percentage of these are induced by criminal interference or abortifacients. In a susceptible

individual almost any stimulus may be sufficient to induce miscarriage, and emotional strain is one which should not be forgotten. It is important to state, however, that unless this predisposition to abortion exists, no drug in the pharmacopœia will act as an abortifacient in therapeutic dosage. Drugs with a reputation in this regard only act in very toxic dosage. The gynaecologist called upon to terminate pregnancy for therapeutic reasons, in the early months, always does so by surgical methods.

It is obvious that this is by no means an ideal time to carry out extensive dental treatment. If it must be done at this time, due regard should be paid to the removal of emotional strain by limiting the time of sessions and, if necessary, by sedation.

The Middle Months of Pregnancy.—From the third month until the seventh month the pregnancy enters a phase far more suitable for dental treatment. The nausea and vomiting, if present, gradually decrease and usually cease by the sixteenth week. The mother usually looks and feels quite well and often has an unusual feeling of well-being. Miscarriages are unlikely to occur in this period. The patient may be treated in almost all respects as any other normal individual. The foetal blood-stream from this time onwards will reflect any changes in the blood-stream of the parent. The placenta probably has some powers of selection, but, in particular, anoxia in the mother will be reflected in the foetus.

If there is a choice of time for treatment it should be preferably completed during this period.

The Last Months of Pregnancy.—During this time the foetus makes increasing demands upon the mother and will double its weight in the last 8 weeks. This is a time in which certain minor disorders such as hæmorrhoids and varicose veins may come to light, as also may one or other of the major complications. As term approaches the uterus becomes more

sensitive to external stimuli and labour may be started by comparatively small events such as the effort of the routine of the weekly wash-day or the taking of a brisk purgative. It is a time at which the average woman may find her housewifely duties a considerable strain. For all these reasons dental treatment is preferably completed before this time. If, however, the patient does not present for treatment until this late hour, it may be expedient to be content with more or less palliative treatment until after the puerperium.

In the light of this summary of pregnancy an attempt will be made to answer some of the questions which concern all who undertake dental treatment for pregnant women.

The usual questions are:—

1. Has pregnancy any effect on the dental and oral tissues?
2. Are any of the drugs or methods used in dentistry of any danger in pregnancy?
3. Should pregnancy influence the extent or type of dental treatment?
4. What dietetic advice should be given?

1. THE AFFECT OF PREGNANCY ON ORAL AND DENTAL TISSUES

a. Caries.—Reference to any standard text-book will show that the current opinion is that pregnancy does not markedly alter the caries incidence. Teeth which are fully formed cannot yield back their calcium even when the blood-stream is making a maximum effort at calcium withdrawal.

The chief cause of the apparent rise in caries is the lack of treatment during and after pregnancy. The difficulty of obtaining treatment is increased particularly after the baby is born. The ties of motherhood make it essential that all dental treatment should be completed before the confinement.

b. The Supporting Tissues.—It is possible for the alveoli to share in a general skeletal calcium depletion. In some primitive communities, osteomalacia, a disease of calcium deficiency, occurs, and is aggravated by each succeeding pregnancy. It is, however, virtually non-existent in civilized communities.

c. The Gingivæ.—It is doubtful whether pregnancy has any effect on the gingivæ of the

majority of women. In some, however, the hormonal changes which occur in pregnancy appear to have a harmful effect on the gingival tissues, resulting in the so-called pregnancy gingivitis. A few of these patients show the well-known pregnancy tumours. (Fig. 1.) These are round, deep-red swellings attached



Fig. 1.—Pregnancy gingivitis, showing the well-known tumour formation.

usually to a gingival papilla. They are extremely vascular and bleed spontaneously from the slightest manipulation or trauma. If removed they will return to their previous size in a few days. They are generally multiple and tend to occur where there is calculus, a rough filling, pre-existing pocket, or some other local factor. They usually give rise to no difficulty in diagnosis. Treatment should be palliative, apart from the removal of calculus or other local factors, as they usually regress spontaneously after pregnancy is over.

2. DRUGS IN PREGNANCY

The only commonly used drugs in the dental surgery fall into two groups—anæsthetics and sedatives.

Anæsthetics.—Local anæsthetics appear to be well tolerated in pregnancy. Some operators feel that adrenaline should be omitted from the anæsthetic mixture. There appears to be little logic in this. The hormone mechanism of pregnancy shields the uterus from the action of all smooth-muscle activators. Even the specific uterine muscle stimulants such as oxytocin and ergometrine have no effect on

the uterus unless labour or abortion has already begun.

General anaesthetics are also well tolerated. Surgery must occasionally be undertaken during pregnancy and provided the patient is well oxygenated the risk of causing abortion is negligible unless the uterus or its appendages are involved in the operative field. Unfortunately nitrous oxide has severe limitations in pregnancy because of the anoxic element. The risk of causing foetal death increases as the pregnancy advances. The dental surgeon who has treated a patient early in pregnancy should seldom be in the position of having to perform extensive procedures under gas late in pregnancy. When, however, a patient presents with an alveolar abscess the risk may have to be taken. The risk is minimal if the anaesthetic is in expert hands and the operation can be limited to a short procedure such as the extraction of a single tooth. Difficult multiple extractions, however, should not be attempted under this agent alone. It is of course possible to reduce anoxia by the use of premedication and by using supplemental anaesthetic agents such as trilene and vinesthene.

This will prolong the recovery period and may be inconvenient at times, but it is preferable to do this than to asphyxiate the foetus.

Sedatives.—These are freely used in obstetric practice and the foetus does not suffer thereby. They may be very useful in dental treatment as it is desirable to abolish apprehension and after-pain as much as possible.

3. THE INFLUENCE OF PREGNANCY ON THE TYPE AND EXTENT OF TREATMENT

In general the aims of treatment are not dissimilar from the treatment of any other patient—namely, to create and maintain a healthy mouth. Treatment sessions should be kept as short as possible. If clearance and provision of dentures is indicated, this should be postponed, if gross sepsis can be eliminated. It is most undesirable that such a dietetic upheaval should take place at this time.

Hospitalization and general anaesthesia should be more readily resorted to than in the

case of the non-pregnant, when impactions and minor oral surgery must be done.

As has been indicated, the middle months of pregnancy are the most suitable ones for treatment, as they are the months when discomforts are least troublesome to the patient, and also when pregnancy is least liable to be upset by outside factors.

4. DIET IN PREGNANCY

A normal mixed diet is adequate in most respects for the expectant mother. It is most important to supply extra calcium throughout pregnancy to meet the drain which will take place in the later months and which will continue throughout lactation. This is readily ensured if a pint of milk is taken per day. In addition the vitamin requirement is increased.

Vitamins A, D, and C are all important in calcification and can be supplied in additional quantities either as concentrates or orange juice and cod-liver oil.

At one time it was hoped that attention to these aspects of diet in mothers would greatly decrease caries incidence in their children. Unfortunately the problems of caries are a great deal more complex than was then realized.

The dentist should stress to the mother the importance of the vitamins and the extra milk, as a help to sound tooth structure. He should also be careful to point out, however, that this alone will not ensure immunity to tooth decay and advise that the child should be introduced to the dentist early in life and before toothache arises.

BRITISH DELEGATE TO DENTAL CONGRESS

MR. TERENCE WARD, oral surgeon at the Queen Victoria Hospital, East Grinstead, visited Rome, under arrangements made with the help of the British Council, to attend the International Dental Congress from Oct. 21 to Oct. 26. He demonstrated British methods of oral surgery before members of the congress at the International Hospital in Rome.

METHOD OF DETERMINING CALCIUM-PRECIPTATING FLUORINE SALTS IN DRINKING WATER AND THE CAUSATION OF MOTTILING

By CHARLES DILLON, D.D.S., L.D.S.

THE author in a recent publication (1952) demonstrated that there was a fundamental difference between the action of sodium fluoride and calcium fluoride upon bone. Sodium fluoride reacts with bone progressively in extremely low concentrations, while calcium fluoride does not react but is progressively absorbed. It was also demonstrated that when sodium fluoride ions were completely balanced by calcium chloride ions, the resultant combination of ions behaved towards bone in the same way as calcium fluoride ions alone in complete solution in the presence of bone; therefore some interchange of ions must have occurred between calcium chloride and sodium fluoride while both were in a state of complete ionization in the presence of bone.

Here, then, is a completely new statement of facts which has not even been touched upon by those who are ready to consider their work so satisfactorily completed that they are now prepared to fluorinate the water supplies of the world.

0.6 p.p.m. as Ca^+ and F^- ions and 0.4 as Na^+ and F^- .

The most serious gap in the study is that which hinges around the causation of mottling. When asked what is the causation of mottled teeth the answer is ready. Mottling of teeth it is stated is due to excess fluorine ions in water. No studies at all have been made to prove that excessive fluorine ions in balanced equation with calcium can produce mottling, nor has it been shown that fluorine ions balanced by calcium ions have any effect whatever on the course of dental decay. The literature on field research is designed to prove that a water supply containing the optimum amount of fluorine ions will reduce dental decay without specific harm to the rest of the body. Again this is unproved. It has been claimed that 0.9 to 1.4 p.p.m. fluorine in drinking water will reduce the incidence of dental caries when

compared with a control group whose water supply contains no fluorine. It is thus concluded that the work on this subject is complete.

It is a fact that in all drinking water containing, say, 0.9 to 1.4 p.p.m. fluorine, and which is capable of reducing the incidence of juvenile dental caries, there is a concurrent degree of mottling, and children drinking from this water supply are affected with mottling in varying degrees, and as the fundamental cause of mottling has never been elucidated, there has been no satisfactory explanation as to why children vary in the degree of mottling.

It is of the first importance to know whether the source of fluorine is derived entirely from calcium fluoride or whether the water contains an admixture of other fluorine salts which are capable of reacting with developing bone or teeth. It is not sufficient to say that the water contains one part per million fluorine. A water supply of 1 p.p.m. fluorine may be constituted as follows:—

A total fluorine content of 0.4 p.p.m. and which is capable of mottling teeth may be constituted almost entirely of calcium-precipitating fluorides.

Weaver (1950) reported a high incidence of mottling in the teeth of children of West Hartlepool, and he says that this is only to be expected from a water supply containing 2 p.p.m. fluorine. He attempts to show a statistical relationship between nutritional condition of the children and dental fluorosis. Smith and Smith (1940) have given some pointed observations on the durability of mottled teeth.

The author has developed a method whereby a water supply can be analysed in order to find out the toxic fraction of fluorine in it. Passing from stock solutions a sample of the

West Hartlepool water supply was taken for analysis. The water was analysed and found to contain 2.5 p.p.m. fluorine.

FRACTIONAL DETERMINATION

1. 250 ml. of the water was rendered alkaline and maintained in an alkaline condition to phenolphthalein, using 3 per cent sodium hydroxide that has been attested free of fluorine. The water was now evaporated down to the point where just a moist slag remained, 10 ml. of distilled water were now added and the sides of the beaker washed down with a stirring rod, taking about $\frac{1}{4}$ hour to this procedure. The fraction was then filtered. The filtered fraction was thoroughly cooled and an equal quantity of industrial methylated spirit added and the precipitate filtered twice through a tight filter using gentle negative pressure. The 10-ml. extract with alcohol was now prepared for direct titration, rendered acid to alizarin S as indicator with one drop in excess hydrochloric acid, and titrated directly with thorium nitrate, 1 ml. \equiv 0.00049 g. F.

The above procedure should rid the fraction of any fluoride other than that which is more soluble than calcium fluoride. In other words, only calcium-precipitating fluorides should now remain in the fraction in sufficient quantity to affect titration.

The analysis should be repeated using twice the amount of water as in the first case, and then half the amount of water to make sure that the amount of soluble fluoride fraction present in the water is not more than would dissolve in 10 ml. distilled water.

Result of analysis of West Hartlepool water supply by the method of direct fractional titration: 0.55 p.p.m. toxic fluorine.

2. In order to verify the above technique another 250 ml. of the water was taken and this time the water was rendered definitely

titration, which means that the fraction 0.55 p.p.m. F. in the first test represented a calcium-precipitating fluoride.

3. A third portion of 250 ml. of water was evaporated as above, after being rendered alkaline to phenolphthalein with sodium hydroxide, but this time the 10 ml. extract with distilled water after filtration was distilled in the presence of hydrofluoric acid, 250 ml. of the distillate was collected, evaporated to a small bulk, and titrated in the usual way. The figure obtained was 0.65 p.p.m. F.

It was to be expected that this figure should be slightly higher since any calcium fluoride that would be present, or other fluorides unaffected by direct titration, would appear in the distillate in titratable form. It was found that when the figure of 0.00004 g. F, which is the amount of fluorine that would be derived from calcium fluoride in solution in 10 ml. of water, was subtracted, after the titration figure was multiplied by the factor 0.00049, the remaining result corresponded very closely with the figure given for direct titration.

DISCUSSION AND CONCLUSIONS

"Soluble fluorides will react with calcium wherever and in whatever form or physical state it is found, and when once calcium fluoride is formed, no further reaction occurs" (Dillon, 1950).

For example, if an equivalent amount of calcium chloride is added to a sodium fluoride solution, a reaction takes place at once.

$2\text{NaF} + \text{CaCl}_2 \rightarrow 2\text{NaCl} + \text{CaF}_2 \downarrow$
and calcium fluoride is precipitated and falls from solution until the solubility of calcium fluoride is reached, when no more calcium fluoride falls out of solution and there remains suspended sodium, calcium, fluorine and chlorine ions, e.g.,



alkaline to phenolphthalein by the addition of fluorine-free lime. The water was evaporated down to a moist slag as before, cooled, treated with an equal quantity of industrial methylated spirit, filtered twice, and titrated directly as before. *The result was nil*

1. If now a substance is added which depresses the solubility of $\text{Ca}^+ \text{F}^- \text{F}^-$ ions, the original reaction will proceed further towards completion.

2. If that substance which is added is also able to absorb and retain $\text{Ca}^+ \text{F}^- \text{F}^-$ ions as a

solid progressively then the reaction will advance to completion.

It has been demonstrated in the publication referred to above: (1) that the presence of bone depresses the solubility of calcium fluoride; and (2) that bone is able to withdraw calcium fluoride from solution; and retain it as a solid. *This is the equivalent of precipitation.*

It is therefore to be expected that if a concentration of 0.55 p.p.m. F not balanced by calcium reaches the blood-stream in the vicinity of bone, a reaction will take place and both calcium and phosphorus metabolism will be fundamentally upset. This is the only scientific explanation to account for mottling of teeth and bone, and it accounts also for the varying degree of mottling in various individuals. Then children whose blood-calcium is already too low, and those who are undernourished and sick will be affected most by the toxic effects of a calcium-precipitating fluoride in the blood-stream.

Bone appears to the author to be the detoxifying centre for fluorine, just as the liver is the detoxifying station for many poisonous substances. Therefore this function of bone must not be overtaxed heedlessly. Perhaps if it was not for this detoxifying function of bone calcium precipitating fluorides would pass through to the placenta and the infant mortality-rate in an endemic fluorosis area might be so alarmingly high as to deter altogether any thought of fluorination.

Finally, the figure of 0.55 parts per million fluorine in the drinking water of West Hartlepool represents a toxic amount and should forthwith be neutralized with fluorine-free lime. A total fluorine content of 0.4 p.p.m. caused mottling in 33 per cent of the child population in Salt River Valley, U.S.A. (Smith, Smith, and Foster, 1938).

Whenever mottling of the teeth is observed it can be concluded that there is a toxic fraction of fluorine in the water.

Mottled teeth are a sign of a greater mottling of bone. As the reported reduction in the juvenile caries rate is inseparably connected with mottling, it would be interesting to find out whether those children who escaped mottling entirely show any reduction in dental

caries rate when compared with a control, but whatever the outcome mottling of bone and teeth cannot be condoned even when brought about by the application of a supposed Public Health measure.

ADDENDUM

Revision of Technique.—The technique described above provides a quick and ready way of determining the toxic fraction of fluorine in drinking water. It was realized, however, that the technique was open to certain objections, and in the case of one water supply examined this objection was in fact illustrated. For example, in the case of certain water supplies with an abundant amount of sulphates, phosphates, organic matter, aluminium, or excessive chlorides, these might be in a sufficiently soluble form to affect the accuracy of the results, even when an equivalent amount of alcohol was added to the fraction and filtered before titration. Consequently it was necessary to revise the technique.

A fresh supply of the West Hartlepool water was again taken as an illustration, pending confirmation of the other water supplies examined, bearing in mind that the purpose of this paper is not to give the analysis of various water supplies but to establish a technique of separating that fraction of the fluorine content of a water supply which is responsible for mottling. However, it might be mentioned here that as small a fraction as 0.08 parts per million toxic fluorine has been found to be associated with very mild mottling in one member of a family of three.

1. *Total Fluorine Content of West Hartlepool Water.*—The water was analysed after distillation in the usual way and found to contain 2.7 p.p.m. F.

2. *Toxic Fluorine Fraction.*—500 ml. was rendered alkaline to phenolphthalein with sodium hydroxide and evaporated down to a moist slag. The more soluble fluorides were extracted with 10 ml. distilled water. The sides of the beaker were thoroughly scoured down with a stirring rod over which a piece of rubber tubing was placed, taking about 20 minutes for this procedure. The extract was filtered twice through a tight filter. The filtrate

was transferred to a Claisen's flask, followed by a washing out of the beaker which collected the distillate. A knife-point of silver sulphate was then added. This was then distilled in the presence of 50 per cent sulphuric acid until 250 ml. of distillate were collected. The distillate was rendered alkaline to phenolphthalein and evaporated down to 10 ml. Discounting loss on the filter-paper, this fraction should contain no more than 0.00005 g. fluorine as calcium fluoride in 250 ml., or 0.2 p.p.m. F., and this allows for the increased solubility of calcium fluoride in an alkaline medium.

Result—0.49 p.p.m. toxic fluorine.

Result by the method of direct titration in this case was 0.56 p.p.m. F.

3. *Proof and Control.*—In order to verify that the fraction above is a calcium-precipitating fraction, a separate 500 ml. was evaporated down to a moist slag. This time the water was rendered alkaline to phenolphthalein, using freshly filtered calcium hydroxide, and evaporated down to a moist slag as before. This was extracted with 10 ml. distilled water, precisely as above,

distilled in the presence of 50 per cent sulphuric acid containing a knife-point of silver sulphate. The distillate was rendered alkaline to phenolphthalein with sodium hydroxide, evaporated down to 10 ml. and titrated. The figure obtained for the titration should not work out at more than 0.2 p.p.m. F., but whatever figure is obtained should be subtracted from (2) above. This would then represent:—

4. *Minimum Toxic Fraction.*—I.e., 0.49–0.10 (figure obtained from (3) above).

Therefore minimum toxic fraction of West Hartlepool water supply was found to be 0.39 p.p.m. F.

N.B.—Mottling of teeth is most likely to occur during ingestion of water between meals containing a toxic fraction or calcium-precipitating fraction of fluorine.

REFERENCES

- DILLON, C. (1950), *Dent. Mag.*, Dec.
 — (1952), *Dent. Practit.*, 3, 79.
 SMITH, M., SMITH, H. V., and FOSTER, E. (1938), *Tech. Bull. Univ. Arizona*, No. 61.
 — — — (1940), *Amer. J. publ. Hlth.* 30, No. 9.
 WEAVER, R. (1950), *Brit. dent. J.*, 58, 231.

RECURRENT HERPETIC STOMATITIS TREATED BY INTRADERMAL INJECTIONS OF INFLUENZA A AND B VIRUS VACCINE

A CASE of recurrent aphthæ in a female, aged 28, which had persisted for about fifteen years, is very fully presented and discussed. There appeared to be a definite correlation to the menstrual cycle, for the onset was one year after the commencement of menstruation, and ulcers were irregular in occurrence until the age of 20, when she married. Shortly afterwards a very definite rhythm was established, the ulcers commencing one week prior to menstruation, becoming progressively worse until it started, and then rapidly healing.

Four complete remissions occurred during periods of pregnancy, although each of these was heralded by a very severe exacerbation.

There was no history of herpetic lesions in her father or sister, but her mother, aged 50, had a history of oral ulceration which she did not recall having had a cyclic pattern, although they had ceased after the onset of the menopause

at the age of 39. Treatment by topical applications (medicaments not stated), progesterone, small-pox vaccine, influenza A and B vaccine, proteolac, neo-calgulonate, and chloromycetin were unsuccessful, although the influenza vaccination appeared to reduce the intensity of the lesions until the patient became hypersensitized.

The patient's religious faith did not permit her to use contraceptives, and she admitted having extreme fear of becoming pregnant, being profoundly relieved when the menstrual flow commenced. Eventually her husband had a vasotomy, but was not declared sterile until four months after the operation, during which period the patient suffered ulceration, stating that she "didn't quite trust the operation". The patient has now experienced several months of relief.—COLLINGS, C. K., and DUKES, C. D. (1952), *J. Periodont.*, 23, 48.

THE JACKET CROWN PREPARATION

By N. LIVINGSTONE WARD, L.D.S., D.D.S.

Assistant Director of Conservative Dentistry, London Hospital Dental School

DIFFICULTY is often experienced in the preparation of teeth for a jacket crown. It is submitted that this is largely due to a lack of understanding of the various steps to be taken to achieve the desired end. If the method of preparation is standardized and

The method of preparing the tooth is done in six stages, each step being completed before the next is commenced. A different instrument is used for each stage, and should be laid out on the bracket table ready for use. The whole operation should be done in an

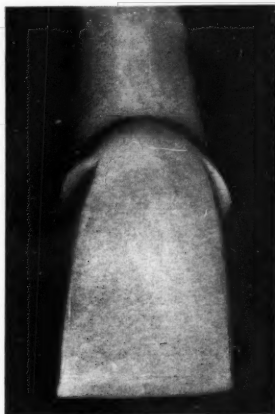


Fig. 1.—Mesial and distal slices (labial view).

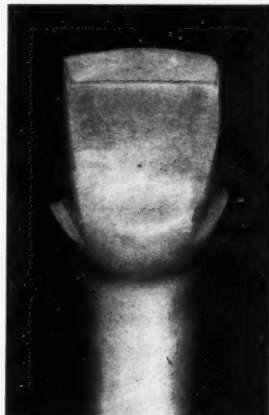


Fig. 2.—Incisal tip (lingual view).

then carefully followed from one step to the next, many difficulties will disappear.

As the commonest tooth for the jacket crown is an upper incisor, the preparation will be given in detail. Although there are many different types of jacket crown preparation depending upon the anatomy, position, and condition of the tooth, the only one that will be described is the more common type with the complete shoulder of uniform width.

TECHNIQUE

The operation is best performed under local anaesthesia, and it is essential that a stream of water is sprayed on to the tooth during all cutting processes. The cutting of so much enamel by direct grinding causes considerable heat, which may easily kill the tooth unless measures are taken to prevent this happening.

orderly and organized manner, and in the minimum length of time.

Stage 1. Removal of Mesial and Distal Slices (Fig. 1).—The instrument of choice is a flexible steel disk,* safe-sided on one side and carborundum on the other. The disk is advanced over the contact point between the two teeth to the gum level. It is then moved inwards, removing the enamel down to the dentine and at the same time forming the shoulder at the level of the gum. The disk being flexible may then be turned, as it revolves, to round off the slice on to the labial and lingual surfaces. At the cervical margins the shoulder is slightly extended in two wings that project on to the lingual and labial surfaces. This is most important, as it may

* $\frac{3}{8}$ -in. Safe-sided "Steelico" steel separating disk.

be seen from the diagrams (Figs. 1, 2) that it leaves four projections, one each from the mesial and distal surfaces on to the labial and lingual surfaces.

At this stage, to facilitate the removal of the enamel, the same wheel stone is used to serrate the enamel by cutting grooves across the enamel and into the dentine. It is found

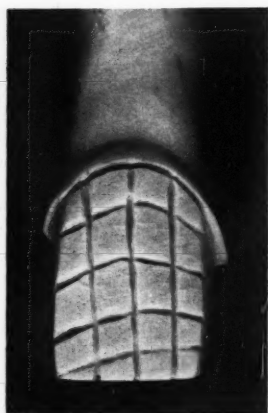


Fig. 3.—Preparation of shoulder and labial surface.

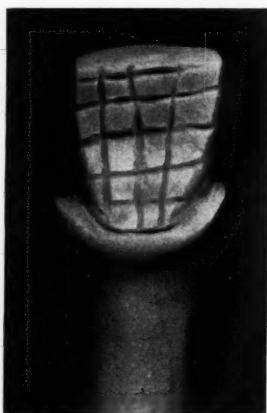


Fig. 4.—Preparation of shoulder and lingual surface.



Fig. 5.—The completed preparation.

This technique requires the flexible steel disk, as it has to be turned over to form the four points. A diamond instrument, or the ordinary carborundum disk, is too rigid and may not be twisted from one surface to the other.

Stage 2. Removal of the Incisal Tip (Figs. 2 and 6).—This may be performed with a 10-mm. diameter diamond wheel. The final incisal plane should be at an angle of 45° to the long axis of the tooth, providing that the tooth is in normal occlusion. In edge-to-edge bites the plane is at 90° , and with a forward bite the incisal edge should be inclined towards the labial surface.

Stage 3. Preparing the Enamel for Removal (Fig. 3).—The mesial and distal shoulders will, from stage 1, be nearly completed with the slight projections on to the labial and lingual surfaces. This step is to join together the four points made by the disk. The instrument used is a small knife-edged wheel (a diamond or a No. A 138 carborundum).

A groove is cut on the gum level to the required depth (1 mm.) on the labial and lingual, connecting the four points together.

that if this is done it will be easier to stone down the enamel, as small pieces will fracture and fall away during the stoning. (Figs. 3, 4.)

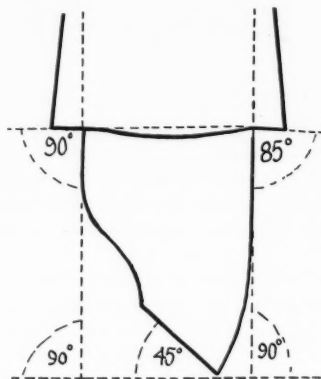


Fig. 6.—Diagram of ideal jacket crown form.

Stage 4. The Labial Surface.—This is done by direct stoning on the enamel. A long tapering diamond stone may be used, the full length of the stone being placed over the whole labial aspect, with the safe-sided top

of the diamond against the shoulder. The instrument must be held to avoid undercuts occurring, particularly just beneath the shoulder.

Stage 5. The Lingual Surface.—This is usually considered to be the most difficult part of the preparation. However, if the first stage is performed correctly, the difficulties will be reduced. The two points formed by the disk have been joined together in the second stage and the shoulder outlined by the knife-edge stone. Up to this point, all operations should have been performed with a straight handpiece. (A straight handpiece is much more accurate than a right-angle handpiece.) The next cut is made with a right-angle handpiece using an inverted cone diamond or carborundum stone. Its object is to remove the enamel in an upwards direction from the shoulder groove. A small right-angle tapering stone is then used to cut down the enamel to the dentine and expose the full uniform shoulder. The remainder of enamel on the

and sharpen the angle between the shoulder and the body. The fine enamel edge left around the shoulder should be trimmed, and a scaler is found useful for this step. The



Fig. 7.—Case A.P.M. Before treatment.

whole preparation should be smoothed with sandpaper disks, and if necessary the angle between the shoulder and the body of the

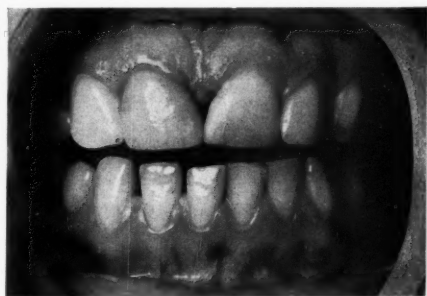


Fig. 8.—Same case after treatment: Porcelain jacket crowns on $\overline{31}$ and $\overline{2}$. The $\overline{3}$ has been converted into a lateral.

lingual surface may be removed with a round ball diamond.

Stage 6. Completion of the Preparation (Fig. 5).—The preparation is now finished, save for one final step. The shoulder has to be lowered beneath the gum level to a depth of 1 mm. It is found that an end-cutting bur is not a satisfactory instrument for this step. The easiest instrument to use is a tungsten-carbide fissure bur, 1 mm. in diameter. This will deepen the shoulder, and at the same time smooth out the labial and lingual surfaces,

preparation should be sharpened with a small hatchet chisel.

The preparation of the tooth for a jacket crown is now complete, and ready for the impression to be taken.

COMMENT

The ideal form of preparation is shown in Fig. 6. However, there are few teeth that will enable a preparation such as this to be made, save for a jacket crown on a normal tooth, changed for æsthetic purposes. This

ideal must be kept in mind though, for the principles employed are based on this preparation. The retention depends upon the near parallelism of the mesial and distal surfaces, and the cervical thirds of the labial and lingual surfaces. If a tooth is so broken

Two cases of restorations with porcelain jacket crowns are shown in Figs. 7-10.

Acknowledgements and thanks are due to Mr. A. M. Horsnell, F.D.S., Director of Conservative Dentistry, London Hospital



Fig. 9.—Case I.P. Before treatment.

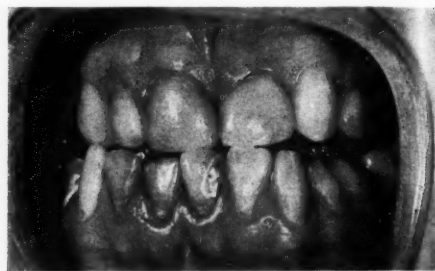


Fig. 10.—Same case after treatment: Porcelain jacket crowns to close diastema and restore appearance.

down, but still vital, it should be built up to the ideal form with a gold inlay, retained by the use of pins. (For pins a No. 23-gauge platinum wire will fit a No. $\frac{1}{4}$ round bur.) The vast majority of jacket crowns that fail are due to a poor preparation. The making of a jacket crown, even in porcelain, is not really difficult, but if the preparation is not correct it will fail.

Dental School, for permission to publish the cases illustrated in Figs. 7-10, and to Mr. Broadberry, of the Photograph Department, for the photographs.

BIBLIOGRAPHY

- TYLMAN, S. T. (1947), *Theory of Crown and Bridge Prosthesis*. London: Henry Kimpton.
BRECKER, C. S. (1951), *The Porcelain Jacket Crown*. London: Henry Kimpton.

TREATMENT PLANNING FOR MOUTH REHABILITATION

DENTAL treatment should be based on a comprehensive diagnosis and plan, the aim being to restore the mouth to a healthy functional condition, rather than merely to repair or replace individual teeth. Home care and periodical re-examination are essential parts of the plan. The diagnosis cannot be completed until all carious cavities have been cleaned, all existing conservations removed (the cavities being temporarily filled with a hard cement), and parodontal treatment commenced. Following this, individual restorations can be planned and incorporated in the general plan, and a judgement made of the patient's attentiveness to hygiene and the response of the tissues. Extensive caries may

suggest a dietary survey. Every restoration must be planned in full detail on models with the aid of a surveyor before work is commenced. Decision must be made as to the location and amount of tooth substance to be removed to compensate for tilting of teeth or extrusion, and the capacity of individual teeth assessed for abutment purposes. It is necessary to employ every variety of conservative and prosthetic device, and the design of restorations will often subserve prosthetic purpose, e.g., by permitting the creation of undercuts and slots. Porcelain pontics are recommended, modified by additions of fused porcelain or cast metal.—GILL, J. R. (1952), *J. pros. Dent.*, 2, 230.

PLANNING AND DESIGN OF REMOVABLE PARTIAL DENTURES

(Continued from page 78)

By COLONEL ARTHUR H. SCHMIDT, U.S.A.F.R. (D.C.)



Fig. 44.—This picture shows, from left to right, the surface produced by five stages of grinding, as follows: heatless stone, carborundum disk, rubber wheel, tripoli, and rouge. In finishing, each successive step should employ progressively finer grits so as gradually to eliminate the deep scratches and produce a smooth high polish.

The importance of high polish cannot be over-emphasized.

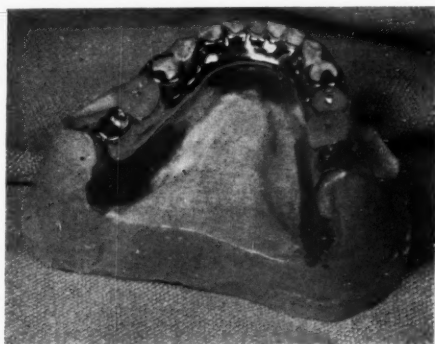


Fig. 45.—This case has been in use now over four years, and is fulfilling the requirements of a good removable partial denture.

Observe the lingual contour developed in the bar as it follows the contour of each anterior tooth.

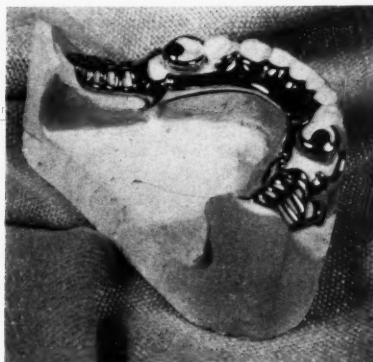
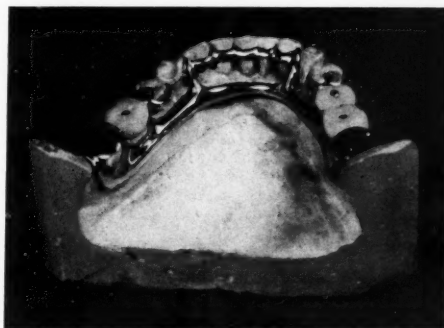


Fig. 46.—The finished gold casting for use with acrylic saddles. Observe the contour and shape of the bar and the close relationship of the top part of the splint bar to the lingual surfaces of the teeth. It is practically impossible for any food to lodge or be retained in this area.

Fig. 47.—Another all-metal porcelain partial for the same patient. The clasps and saddle design are the same, but a Kennedy bar was constructed for indirect retention. An indirect retainer of same type is necessary in all double free-end saddle cases. The disadvantage of this type of bar is that food collects between the bars and the patient is constantly trying to clean the area with the tongue.



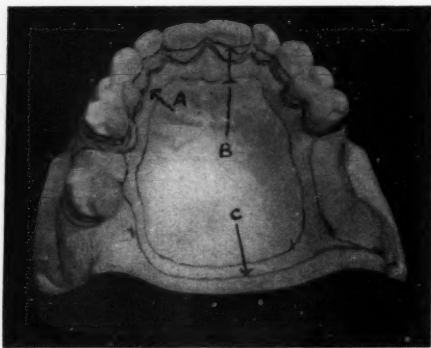


Fig. 48.—This cast was surveyed with a slight posterior tilt, thus obtaining an undercut on the distal and buccal of the left second bicuspid. It is designed for a back-action clasp on the left 2nd bicuspid, a No. 1 clasp on the right 2nd bicuspid, and a ring clasp on the molar. It is important that the free margin of the gum around all teeth covered by the bar must be protected, and that is accomplished by filling the gingival crevice A with undercut wax. The width of the anterior splint bar as indicated by B will vary as to tooth coverage, but the width of the bar on the tissue above the gingival crevice is the width of a Kerr's No. 6 half pear-shape wax form. C indicates the outline of the posterior bar at the Letter junction of the hard and soft palate.

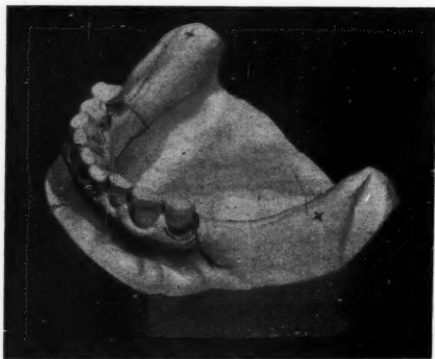


Fig. 50.—This lower double free-end saddle case was surveyed with a slight posterior tilt, to create the undercut condition on the distal surface of both abutment teeth. A tissue undercut was present on the buccal side of both abutments and very little undercut on the lingual of the teeth, so the back-action clasp was selected rather than the No. 2 clasp, or the combination No. 2 and No. 1.

Fig. 52.—Another casting on the cast showing a combination clasp on the right 2nd bicuspid, a No. 2 clasp arm on the buccal, and a reverse No. 1, or a modified No. 2, on the lingual. A reverse back-action clasp is on the left 2nd bicuspid, and a ring clasp on the molar.

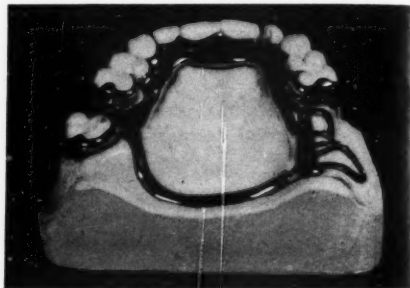


Fig. 49.—The finished casting on the cast definitely places the clasps in position against the undercut wax shelf.

This posterior view clearly shows the contoured anterior splint bar as it extends over on to the anterior teeth. It is essential to reproduce the tooth contour in the bar, for comfort to the patient and to reduce the bulk of material in the bar casting.

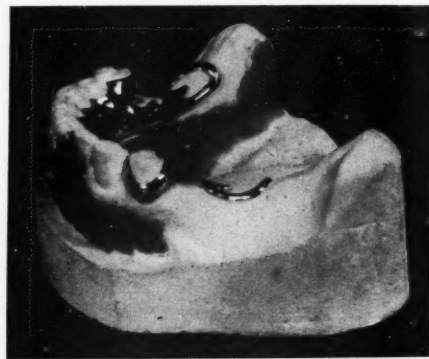
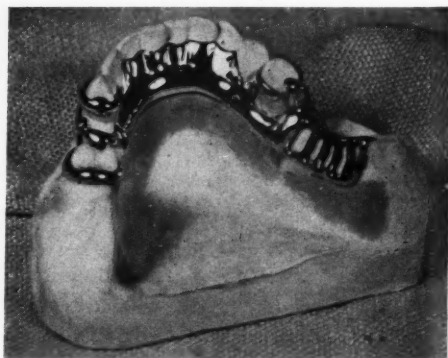


Fig. 51.—The finished casting is placed back on the cast to check the relation and position of all parts to the cast. The buccal arm of the back-action clasp can be observed in its proper seat to the undercut wax shelf. Also note the finish line on the lingual bar on the right side and its position to the distal-lingual surface of the right 2nd bicuspid.



NEW MATERIALS

SELF-POLYMERIZING ACRYLIC FILLINGS

A GREAT deal of interest is being taken in the self-polymerizing acrylic filling materials. Although these materials have been known for some time, it is only recently that manufacturers have claimed to have perfected the materials and the technique for their use. Undoubtedly much research has gone into the commercial production of these specialized acrylics and many problems have had to be solved. Not the least of these have been the questions of shrinkage, heat production, colour stability, and the effect upon the pulpal tissues of the tooth. Each manufacturer has his own methods of overcoming these difficulties, but most firms are still performing research to perfect the material.

In general it may be said that these materials do not replace the well-established uses of amalgam and gold, but do tend to be used instead of materials like silicate, where an aesthetic result is required.

The cavity preparation is similar to that for a silicate, with square enamel edges and good undercut retention. All cavities should be well lined with an oxyphosphate cement. The acrylics are not compatible with the volatile oils, so zinc oxide should not be used. The dentine may of course be lined first with a zinc-oxide mixture, providing that this is sealed over with the cement lining. When using these acrylic fillings, it is essential that no hydrogen peroxide should be used to clean the cavity. Hydrogen peroxide will cause discoloration of the filling. The material is useful for facing gold inlays and for temporary jacket crowns, as well as for the ordinary Class III cavities.

The technique for the use of three self-polymerizing materials now on the market is given.

**DENTAFIL
(Trepal Ester)**

The original Dentafil was the first self-polymerizing acrylic to cure without the application of external heat. This material has now been improved with the introduction of

trepal ester. This chemical has the function of cross-linking the polymer chains, which apparently prevents the continuing chemical action of the catalyst employed. (In some cases a continuing action may cause colour changes.)

Trepal ester is a liquid added to the Dentafil liquid on the slab, and does not complicate the already simple technique. The incorporation of this liquid into the monomer gives adhesion to the cavity walls during polymerization. This inherent characteristic forms the compensating factor governing the shrinkage value of the acrylic. Shrinkage always occurs with the polymerization of any acrylic. With trepal ester shrinkage is made to take place towards the cavity walls instead of away from them, resulting in good marginal fit and the avoidance of using more pressure than necessary to maintain the desired contour of the finished filling. With trepal ester the Dentafil mix becomes smoother in working and setting is faster, enabling the safe removal of the matrix strip in from $3\frac{1}{2}$ to 4 minutes from the insertion of the dough. Dentafil with trepal ester is mixed on a slab, powder and liquid, with a folding and pressing action until the dough stage. The filling is inserted and kept under pressure until it is completely set and bone hard. Although it is usual to use this material in a plastic stage, it may be used in the brush technique in suitable cases.

SEVRITON

This is a recent addition to the ranks of self-polymerizing acrylic filling materials. Although at first sight the technique appears complicated, once it is understood it becomes quite simple.

The material is mixed to a near plastic stage and inserted into a standard cavity and kept in place with a cellophane strip (celluloid strips should never be used with acrylic). A special catalyst is mixed with the correct amount of monomer and the powder added to form the filling material. Before the filling is inserted the cavity is coated with a cavity seal which acts as an adhesive. The aim of this seal is to

penetrate the dentinal "lattice" with a polymerizable product having an equal affinity for the tooth structure and the filling material in the cavity. By this means the direction of the shrinkage is controlled so that the material is well adapted to the walls, with no shrinkage of the material away from the cavity. The material takes about 4 minutes to mix and prepare and remains in the cavity for a further 3 minutes before removing the strip. The filling may be completed in one sitting, including final polishing. As with other acrylics, the lining should not be of zinc oxide and eugenol, unless it is first sealed in with an oxyphosphate cement.

SWEDON

Swedon is a Scandinavian product and has been in use all over Europe for a considerable time. Consequently there is a large volume of Continental literature on the material and many aspects of research into its chemical and physical nature are known. Tests, using the A.D.A. specifications, have been performed on flow, water absorption and solubility, pH value, surface hardness, and discoloration with chemicals.

The material consists of the usual powder and liquid, with a "reactor". The reactor is a

dental varnish containing a catalyst. Before the filling is inserted the cavity is painted with the reactor and warmed with hot air. The acrylic is placed in the cavity in a semi-fluid condition. The catalyst, being on the floor of the cavity, will cause a stratified polymerization from the base and walls towards the centre of the filling surface. A slight concavity may be seen to appear on the surface as the shrinkage takes place into the base of the cavity. As only a semi-fluid acrylic is used, more material may be added to the filling to build it up in stages until the final contouring is achieved. Shrinkage is therefore overcome by this compensating mechanism.

The manufacturers of Swedon have developed the technique of using a brush for inserting the filling. The filling when placed is in a semi-liquid condition and may be inserted a little at a time. Polymerization takes place in layers, compensating for shrinkage, and building up the filling to the correct contour. This technique is recommended where temporary jacket crowns and bridges are concerned. Posterior as well as anterior teeth may be treated in this way.

In the Swedon technique no pressure is used, but a cellophane strip may be helpful in controlling the material.

THE CEMENTO-ENAMEL JUNCTION

THE result of laboratory investigations of instrumentation using both periodontal curettes and planes as well as a spoon-shaped Kingsley vulcanite scraper on 500 extracted teeth from the mouths of 312 patients which had been kept moist in zephiran chloride solution are reported. The conclusions reached are that the dentine is already exposed in large numbers of teeth before the cemento-enamel junction is curetted and planed. Secondly, that denuded cemental surfaces are not sufficiently hard and resistant for a durable protective covering of an exposed root surface, there being an increase in the roughness and caries incidence with increasing age. Thirdly, it is impossible to plane the cemento-enamel junction to a smooth, hard surface without

removing the cementum in its entirety. The author is convinced that this inevitable removal of the cementum at the cemento-enamel junction is desirable, and supports his belief by ten years' clinical observation.—
RIFFLE, A. B. (1952), *J. Periodont.*, **23**, 41.

THE TWO FIFTY CLUB

The Seventh Annual Reunion Dinner of THE TWO FIFTY CLUB (Non-Regular Ex-Officers, Royal Army Dental Corps) will be held at the Victory Club, 73-76, Seymour Street, Marble Arch, W.2, on Saturday, Jan. 31, 1953, at 7 p.m. Tickets and particulars from the Hon. Secretary, Major J. W. Cooper, 726, Fulham Road, London, S.W.6.

THE PROCEEDINGS OF THE BRITISH SOCIETY OF PERIODONTOLOGY

President: S. CRIPPS, L.D.S. R.C.S. Eng.

Hon. Secretary: H. THOMSON, L.D.S. R.F.P.S. Glasg., H.D.D. R.C.S. Edin.
53, Portland Place, London, W.1.

Vol. III, No. 2

December, 1952

DENTAL HEALTH EDUCATION IN SCANDINAVIA

By P. M. C. JAMES, L.D.S. R.C.S., D.P.D.

In the early part of this year I was fortunate enough to be awarded the first Gibbs Travelling Scholarship. Messrs. D. & W. Gibbs generously financed a three-months tour of Scandinavia, and the selection was undertaken by a committee appointed by this society. The object of the trip was to study dental health education, and it was with this in mind that I left this country last March.

Dental health education has to be considered under two main headings: first, the background of routine dental services available, their efficiency, availability, and status, and the relation of the public towards them; and secondly, the actual propaganda necessary to implement the normal automatic education that takes place within this framework.

Of the two, the first is, in my opinion, the more important. Propaganda without an effective means of meeting the interest produced by the propaganda would be ridiculous, and if the dental services are poor the propaganda will be ineffective, as the dental consciousness of a community depends to a large extent on the efficiency of the services available to maintain their dental health. Many important preventive measures can be performed by the individual—choice of diet, tooth-brushing, etc.—but to act as an incentive and to maintain the interest regular supervision by dentists is essential. For this reason a study of dental health education would not be complete without considering many factors, including the size of the population, the standard of general education, the distribution of the population, distribution of the dentists, status of the dental profession, education of the dentists

themselves, and the standard of the public dental services. All these factors seem to me to play an important part in the degree of dental-mindedness of a community. I do not think this is the place to embark on a detailed analysis of dentistry and dental services in each individual country; I shall rather attempt to look at the Scandinavian scene as a whole, and only mention the countries by name where some aspect in them differs from the whole, or where some point is of particular interest. And if I overstress the school dental services at the expense of other services, it is because I feel that the relationship of the general public to the dental profession is founded in the schools, where the child, at an impressionable age, is brought into contact with that profession. This is particularly applicable in Scandinavia, where 99 per cent of the population attend the public schools; and in these countries the main emphasis in the education of the public is placed on routine dental health and oral hygiene instruction in the schools and the school dental clinics.

POPULATION

The total population of Scandinavia is about 18½ million, and the number of dentists in all branches of practice is 8030, giving an overall ratio of one dentist to every 2304 of the population, as compared with 1 to 3333 in this country (*Fig. 1*). So we would need a total of 21,000 dentists to reach the same level as they have, or in other words, an additional 6000. A high proportion of the population tends to crowd in and around the large cities, and naturally the dentists follow suit, with

the result that there are vast tracts, especially in northern latitudes, where the scattered population makes dental practice difficult and uneconomic. One of the problems facing these countries is the decentralization of the dentists—encouraging them to leave the towns and scatter more evenly over the countryside, especially in the north. In Norway 70 per

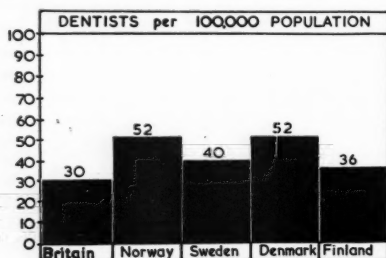


Fig. 1.—Note that the number of dentists in Sweden is more than this diagram shows, because the higher scale of fees in the Swedish Public Health Services attracts dentists from the other Scandinavian countries.

cent of the population lives in the country and 30 per cent in the towns, while the reverse is the case for the dentists, of whom 30 per cent are in the country and 70 per cent in the towns. The Norwegians are attempting to solve this problem by subsidizing dentists who elect to live in the remoter regions—they are gradually evolving a National Health System rather like our own, but including the school dental service. They are bringing this scheme in gradually, as the economy of the country and the number of dentists available permit, and at present this scheme is confined to Finmark, a very northerly part of the country, and one that suffered severely from the "scorched earth" policy of the retreating German armies. In this region almost every building in every town or settlement was burned down, so there is a formidable problem of resettlement in the area.

In Finland the cession to Russia of Karelia, Porkkala, and other strategic areas has caused difficulties as the population of these areas moved out rather than lose their Finnish citizenship, and now one person in nine in Finland is a displaced person.

On the whole, however, the higher dentist-public ratio that exists in Scandinavia than over here makes the availability of dental services more favourable, with the possible exception of the areas north of the Arctic circle.

EDUCATION

There are very few private schools in Scandinavia, and all classes of children attend the public schools, which are very good indeed, providing an excellent general education. They start at school later than we do, at 7 years old instead of 5, and the school-leaving age is 14. At this age the children sit an examination, which gives the successful ones the opportunity of entering high school if they wish. At 18 to 19 years these take the school-leaving examination, and if they pass this they can proceed to the university. All public school and university education is free.

Where accommodation is limited, and the demand exceeds the possibilities of training, as in most of the dental schools, the entry is competitive; only those with the highest marks in the school-leaving examination are considered. For this reason, education is taken very seriously in Scandinavia, and the resulting high standard affects both the dental health of the public and the status of the dental profession. On the whole the better the general education of the public, the less propaganda you have to do in dental subjects—health and hygiene are much more taken for granted. Elementary anatomy and physiology are taught in the schools; I went, unheralded, into a classroom of 11-year-old schoolchildren in Helsinki and found a lesson in progress with a large diagram of a histological section of the skin draped over the blackboard. They were learning about sweat-glands. In some countries dental health is taught as routine in the schools; in Finland there is a compulsory text-book on the subject.

The competitive nature of entry into the dental schools ensures that only the most promising material is recruited for the dental profession. Often there is also a preliminary course for prospective dentists after the school-leaving examination, but before being accepted for the dental course.

In Denmark the capacity in the dental school is 100 new students a year, and an average of 250-300 applications are received for the vacancies. The 200 with the highest marks are selected for the pre-dental course, which lasts from September to the following May, and is followed by an examination in the principal subjects, including anatomy, physiology, chemistry, dental anatomy, and general dental technology. The top 100 are admitted to the dental course proper, and the remaining 50 per cent are permitted to attend the pre-dental course a second time if they wish. In Finland the elimination course is of six weeks' duration.

The average length of the full dental training is five years, and the course is similar to our own, except that more work is done on root canal therapy and crown and bridge work, and rather less on the denture side. General anaesthetics are not used for routine extractions, and the subject is only taught in theory. The dentist is in fact forbidden by law to give general anaesthetics. Children's dentistry is taught systematically, and this training also includes simple orthodontic procedures, which they term "preventive" orthodontics—early use of Andresen appliances, cusp grinding in appropriate cases, pushing centrals over the bite, etc. Orthodontics is also, of course, taught more fully in a department of its own.

In Copenhagen the students do 144 hours of practical work and lectures on children's dentistry. In Malmö the total is 195 hours, and in Oslo 150 hours, but the time here is shortly to be extended to 255 hours. Many Scandinavians who wish to specialize in children spend some time at the Eastman Dental Institute in Stockholm.

Children's dentistry rates high in importance in the Scandinavian dental schools, a factor that may help recruitment into the school dental services. In Norway the newly-qualified dentist will be compelled by law to spend two years in the public health services, and in Denmark the graduate has to spend a two-year internship, either as an assistant in general practice, or in the armed forces or school dental service. After this two-year period he may start in practice on his own

account if he wishes. The higher qualification of doctor of odontology is awarded for original research; the candidate submits a thesis and undergoes a public disputation on it. The university concerned appoints an individual called a "first opponent", who is a sort of prosecuting counsel. He criticizes the thesis and the candidate defends it. The battle of

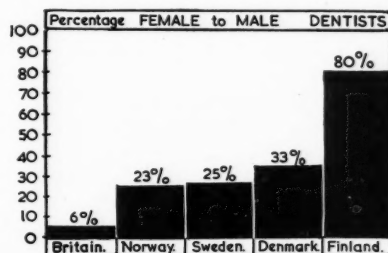


Fig. 2.—Comparison of the ratio of female to male dentists.

words will continue for as long as four hours, and spectators are allowed to join in. At the conclusion the panel of judges confer and either pass or fail the candidate. In Sweden passes are graded, and the degree of marks obtained may decide the limits of academic attainment of the individual for the rest of his career.

The ratio of male to female dentists in a country seems to have a bearing on the recruitment for the school dental services, as women often prefer the regular hours and routine of these services to private practice. There is a higher proportion of women dentists in Scandinavia than we have over here (Fig. 2). Of all dentists in Denmark, 33 per cent are female, in Sweden the ratio is 25 per cent, in Norway 23 per cent, and in Finland 80 per cent. In all the countries a high proportion of the newly-qualified women enter the school service at once. There is, as is to be expected, a certain wastage among the women dentists due to marriage; in fact, it is estimated in Denmark that only about 25 per cent of the available woman-power is effective at any one time. That is to say that out of all the women's potential working hours, 75 per cent are wasted from the dental point of view. This figure is arrived at by some women

retiring immediately they are married, some continuing to work part-time, and some (rather few) working full-time.

The output of trained dentists in the countries I have visited is: Denmark, 100 per annum; Norway, 50; Sweden, 180; and Finland, 60. Denmark has one dental school, in Copenhagen, with a capacity of 400 students and another 200 doing the elimination course; Sweden has two schools, one in Stockholm and one in Malmö, with capacities of 500 and 400 respectively. Finland has one dental school, in Helsinki, training 175 students, and there is one in Norway, the Oslo school, with 200 students. Some Norwegian students are trained in Sweden because of shortage of accommodation in their own country.

All these schools are modern and well equipped. The Malmö school, in south Sweden, is outstanding for its great size and the lavishness of its equipment.

The fact that the population does not go to school until 7 years old presents one immediate problem—dental care does not really start until the child comes into the sphere of the school dental service, although in some areas, particularly large cities, pre-school children are treated as well. By 7, in a sweet-eating population, many of the deciduous teeth cannot be saved, and have to be extracted. Therefore an important aspect in the countries' dental health education is to put forth propaganda designed to control the diet of the population at risk. Many posters and leaflets are seen with the object of discouraging the massive consumption of sweets, and emphasizing the value of a sensible diet both from a calcific and a locally detergent point of view.

With the possible exception of Finland, I thought that the teeth were worse than ours, particularly in Sweden. In one class of 12-year-old girls that I examined in Gothenburg, nearly a third had lost all their six-year-old molars, and nearly all of them had large MOD amalgams in their pre-molars. The Swedes themselves attribute this to the enormous amount of sweets eaten by the children; from my personal observation they appeared to be eating or sucking almost throughout their waking hours. There is a type of sweet

pastille costing only about fourpence a box, and a box of these can be guaranteed to keep the sugar concentration in the saliva at a high level the whole day. The senior dental surgeon in Gothenburg told me that at a recent investigation it was found that the children spend 1s. 5d. per head every day on sweets. In Sweden, also, a lot of the bread is sweetened—sugar is baked into it, and the resulting loaf is sweet and sticky.

The school dental services in all the countries I saw were well-staffed, well-equipped, and held in high repute by the public and the profession alike. The aim is to have one dentist to 500 or 600 children, and in some of the cities at any rate this is nearly a fact. There is usually a central clinic, where the senior dental officer has his headquarters, and where the specialist work of the area is performed. There are often as many as ten surgeries, all equipped especially for the nature of the speciality treated there—orthodontics, root treatments, oral surgery, etc.—and it is to the central clinic that the more difficult or complicated cases are referred. Routine treatments are carried out by school dental officers in clinics distributed around the city, and in the great majority of cases these clinics are in the school buildings themselves, and they are built in the school specifically for dental clinics, and are not just dark converted classrooms. This seems to me to be a point of most paramount importance. The dentist is a part of the general school routine, not a rather irritating visitor. The child grows up with the idea that dentistry is as much a routine as school dinners, and this fact is probably worth all the propaganda campaigns that ingenuity can prescribe. Whole classes are examined together and treated together, with the fullest co-operation of the school authorities. In the rare event of a parent refusing treatment, the child concerned is conscious of being "different"—that condition most dreaded in childhood.

In Denmark the parent does not have to sign a consent form; it is assumed that treatment is desired unless the dental authorities have written evidence to the contrary. That simple fact cuts out a great many borderline

refusals due to apathy. In Norway a consent form is necessary, and if treatment is refused it is impossible for that child to receive any dental care in the future years unless he is first made dentally fit at the parents' private expense, when he may be re-admitted to the service. In all the countries, however, the acceptance rate is as high as 95-99 per cent.

All the clinics, as I have mentioned before, are beautifully planned and equipped, a factor that makes for confidence of the patients and attracts the dentists to work in them. A school of 1000 children will have two surgeries, or a large surgery with two chairs. There are comfortable waiting rooms, especially designed to amuse the young patients, with books, dental propaganda material, rocking-horses and toys, with a high standard of attractive interior decoration. There will probably be a separate room for sterilization, usually by dry heat, another for X rays, and a comfortable rest room for the staff to sit in and drink their coffee. The larger clinics even have kitchens to permit them to cook their meals, if they want to. I also saw little rooms fitted with spittoons and drinking fountains, and in here the children awaiting their appointments clean their teeth beforehand, under the guidance of the chairside assistants or of hygienists. Norway, and Oslo in particular, uses hygienists quite a lot in the school dental service. Their duties are rather wider than is the case here. As well as scaling and polishing, applying fluorine, giving educational lectures and instructions in oral hygiene, they also conduct the initial examination of the children and chart the mouths before the dentist sees them. In this way, the more urgent cases are picked out for priority treatment. Norway is at present the only Scandinavian country with hygienists. The course is one year, and they are trained in the dental school as they are required. Oslo has one hygienist to about every 2800 children. In Finland, in 1947-9, a school for hygienists was started in conjunction with the dental school, and this produced 25 dental hygienists. Apparently there was no demand for them, so the experiment was discontinued. At the present moment I believe Sweden is considering the training of hygienists.

Work in the school dental clinics starts early, about 8.15 a.m., and continues, with a short break for lunch, until about 3 p.m. Some of the staff, including the full-time staff, have private practices, this being permitted. The fact that private practice and part-time work are allowed naturally increases the number of dentists that enter the service. In many places the end of the day in the school clinic sees a new staff coming in at 4 p.m. to use the same premises for the treatment of other groups of the public: pre-school children, students, expectant and nursing mothers; no surgery is allowed to remain idle if there is useful work that can be performed in it, and if the staff is available to run it.

The standard of work I saw done in the school clinics was uniformly high. Half-hour appointments are given, and the permanent teeth are mainly concentrated on. If the child has had treatment of its deciduous dentition, this is maintained, otherwise emergency treatment only is done on the primary teeth. Some space maintainers are fitted, but this is not general routine. Orthodontics is done in most of the large towns and the cities. Extractions are always done under locals except in very unusual cases, when an anaesthetist must attend.

The organization of the school dental services was similar all over Scandinavia. The municipalities organize and maintain the service, with dental advisors, and usually with state subsidy. In Denmark no state subsidy is available directly, but in some cases the county helps the municipality and the state helps the county. Municipal rates are generally higher than in this country, and are assessed on income, not on the nature of the property owned. School dental service is free of charge, but in some countries a charge is made for the care of the pre-school children and children between the ages of 14 and 18. In Norway this charge is 5s. and 10s. respectively per year. In Sweden a charge of roughly 7s. per year is made for schoolchildren, but in many cases this is paid by the town or parish.

All the Scandinavian countries are expanding their scope of dental services rapidly—in Oslo shortly the scheme will be extended to

include young people up to the age of 21, and even some of the merchant ships have surgeries built into them. Free voyage with keep is offered to a dentist and his wife in return for dental treatment of the crew! Sweden has a similar scheme, particularly in her oil-tankers.

Here are some figures to illustrate the availability of treatment for children. *Bergen* has a school population of 9000, and a dental

I saw several other clinics in the course of being built. *Gothenburg* has 42,000 school and pre-school children and 100 full- and part-time dentists to look after them. *Fig. 3* shows the full details of the municipal dental department services of *Gothenburg*. With facilities like these, dental consciousness is bound to be at a high level. By way of comparison, let us consider *Middlesex County*.

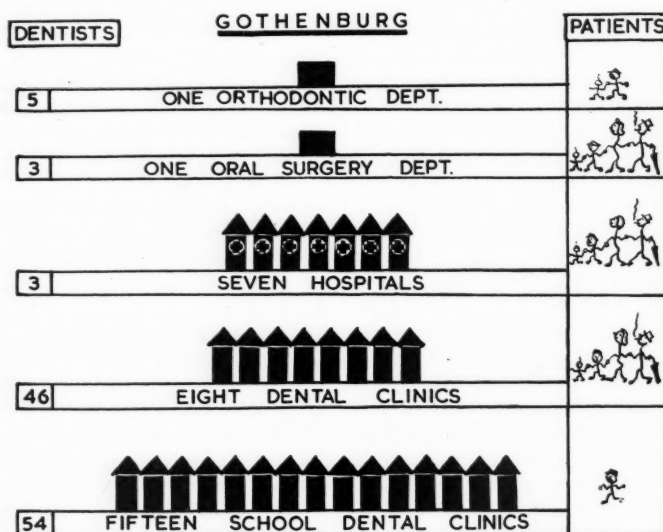


Fig. 3.—Diagram illustrating the municipal dental services of Gothenburg.

staff of 16 full-time officers—or 1 dentist to about 560 children. There is a central clinic, and 7 clinics in school buildings. In spite of these facilities, *Bergen* considers that it is short of school dentists, and 86 private practitioners have volunteered to share the treatment of young people between 14 and 18 years old. *Oslo* has a school population of 30,000, and 100 dentists, whole- and part-time, to look after these, together with pre- and post-school children of the city; giving the approximate figure of 1 dentist to 800 children. There are 57 clinics, of which 3 are mobile. An emergency dental station is maintained and is open for treatment of pain every night from 9 p.m. to midnight, and on Sundays from 12 noon to 3 p.m. and 9 p.m. to midnight.

This has a total school population of 282,530. The approved establishment is only 97 full-time school dental officers, or 1 dentist for every 3000 children. And unfortunately, at the present time, even this establishment is by no means available. A year or so ago, I believe, it was reported that in Great Britain as a whole, the School Dental Service had collapsed to 1 dentist for 8000 children.

Up to now I have been concerned with that part of dental health education that can be considered under the heading of routine, or intrinsic education. I have tried to show that in Scandinavia there is (a) a high standard of general education, (b) a favourable dentist-public ratio, (c) competitive selection of the prospective dentists, (d) adequate training in

children's dentistry, and (e) an efficient, well-staffed, and respected school dental service which is immediately available within the school buildings. This is, in my opinion, a desirable or even essential framework of dental health education, and has produced an acceptance rate for dental treatment as high as 95 per cent.

school, and if this rule is broken, the teacher has the right to warn the home concerned.

I should like to deal now with the actual methods and trends of dental propaganda: the extrinsic education. This is important because it can be used to educate in chosen directions, mostly preventive directions, and



Fig. 4.—A school dental clinic in Oslo.

Before leaving the subject of routine education I should mention the well-known Oslo breakfast. This is given to the children on their arrival at school in the morning, and consists of milk, hard bread (a sort of Ryvita), margarine, fresh fruit or raw carrots, and a selection of meat, fish, and goat's-milk cheese. This meal was introduced in Oslo in 1931. It gives the child a very nutritious meal (estimated at 720 calories); it makes him chew hard, and contains nothing likely to damage the teeth. In addition, it serves to educate parent and child in the best type of food to eat, and this trend is naturally reflected in the home. In Oslo, too, the School Board has laid down that a child must wash, comb his hair, and brush his teeth before arriving at

acts as a stimulus to the general dental consciousness, which should be present all the time.

DENTAL PROPAGANDA IN SCANDINAVIA

The objects of this are several. They can be roughly summarized as follows: (1) To promote good oral hygiene methods; (2) To encourage a sensible diet both from a calcific and detergent point of view, and to discourage excessive sweet-eating; (3) To keep dental affairs in the public eye to promote and maintain general interest.

Methods.—The press, in Scandinavia, plays a much more important role in dental health education than in this country. Dentistry is

considered to be of sufficient general interest to merit space in the national newspapers of all parties, and the public interest is not thought to be confined only to the discreditable acts of the occasional individual. All items of general dental interest are represented—conferences, results of dental research, dental personalities, visiting dentists from other countries—all these are accurately reported with the usual dash of human interest to put them over. When I was in Finland my visit was timed to coincide with the 60th anniversary meeting of the Finnish Dental Association, and by our standards, at any rate, a considerable amount of the newspapers was devoted to a description of the ceremonies: lists of interesting foreign delegates, with suitable photographs; summaries, in popular form, of the lectures and discussions; interviews with delegates—Danish, American, Russian, Swedish, English—many nationalities being represented.

I could not help comparing the small amount of space that our own, much larger, congress obtained in the British press in July. The same holds good all over Scandinavia—the general dental consciousness of the nations, the co-operation of the newspaper proprietors, the fact that there is plenty of newsprint, and (most important) the fact that the dentists usually have a public relations officer to give handouts to the press; all these awaken and maintain public interest and tend to increase the status of the dentist with the public. In addition to straight reporting, the newspapers also print articles on dental health written by dentists; and their advertising space is utilized by the dental associations for dental propaganda.

Some countries publish periodicals dealing entirely with dental health. In Norway there is the Norwegian Society for the Preservation of the Teeth. This society is financed by private subscription, and deals with all branches of dental health education in Norway. Among its other activities is the regular publication of a magazine called *Munnpleien* (Mouth Care), dealing with items of dental health of the public. This is issued to dentists, doctors, schoolteachers, newspapers, municipalities,

etc., all over Norway. The Danish equivalent is the Danish Society for the Care of Children's Teeth, and their periodical is called *Tandplejen* (Tooth Care). The King of Denmark is a patron of this Society. In addition to special societies for the purpose, dental health education is also undertaken by state services, municipal dental services, and the dental associations themselves.

Most of the posters I saw aimed at promoting a sensible diet among the children and discouraging the excessive consumption of sweets. Others demonstrated the importance of tooth-brushing and oral hygiene. The same can be said of the many leaflets and pamphlets that are available, and usually to be found in the waiting-rooms of the clinics. Some posters, leaflets, and pamphlets are the result of a shared interest between the dental profession and some other organization. For example, in Norway there is considerable liaison between the dentists and the producers of milk products—milk, cream, butter, cheese, etc. The producers want to advertise their products, and the dentists want to see the public using them. Accordingly a series of pamphlets are available emphasizing the importance of a calcific diet in dental health, written and produced jointly by the interested parties. In Sweden the sugar manufacturers have made large financial contributions to further the study of dental caries, but the relationship here is not quite so happy, as the sugar manufacturers resent—perhaps not unnaturally—the campaigns aimed at preventing the massive consumption of sweets.

In Sweden they went in a great deal for little booklets and cards with outline drawings of dental subjects, incorporating a printed letter to parent or guardian. The child colours the drawing in school, reads and signs the written matter, which is on the subject of dental care, and sends or takes it home. In Sweden also I saw a humorous play on a dental subject, designed for the children to read or act in school. It deals with the toothache of a King Caramel, and his adventures with the school dentist, a Dr. Guld Krone. In Finland, as I have already mentioned, there is this text-book on dentistry for reading

in class. It takes the form of a series of conversations between schoolchildren, some intelligent and dentally-conscious and others who are neither! Another excellent book that must be mentioned is Dr. Kring's book in Danish, *What can I do to keep My Teeth?*, an elementary text-book on dentistry meant for the instruction of schoolteachers, parents, older children, and medical ancillary and social workers.

In the school clinics small prizes, such as sticky labels, picture postcards, etc., are sometimes given to children, especially small children, if they behave themselves during a dental visit. If they are outstandingly good a gold star is attached to the dental card, and this honour is much coveted by the children. Those children that I saw under treatment were behaving in the dental chair much the same way as do our own: there were the usual difficulties with some of them. Parents were interested and co-operative. Several of the countries have had broadcast talks on dental subjects; while I was in Denmark a Danish friend was preparing a script for broadcasting. Television is not yet generally available in Scandinavia.

CONCLUSIONS OF SCANDINAVIAN VISIT

To be effective, dental health education must have as a background:—

1. An efficient and effective dental service, particularly for the priority services.

2. For this purpose sufficient numbers of dentists must be trained and a proportion of these diverted into the school dental service. This can be done (a) by stimulation of interest in children's dentistry by training in this subject during the dental course or introduction of a post-graduate diploma; (b) by making the school dental service attractive enough to draw the newly qualified dentists.

It is reasonable to suppose that if the children are dentally conscious throughout their school days and adolescence they will tend to remain so all their lives. This benefits not only the strictly public health viewpoint, but the business aspect as well. The child that has a memory of good dental treatment is the

prospective patient of the private practitioner in the future; if the recollection of school dental treatment is an unfortunate one, that individual is likely to be one of the many whose idea is to be fitted with full dentures as soon as possible.

3. While waiting for treatment, and during the chairside work, dental propaganda can be given by the dentist or by a dental hygienist. The system whereby the child awaiting his turn is instructed in tooth-brushing by a hygienist struck me as particularly sound. The child has to bring his toothbrush, which means that it will be inspected and discarded if it is unsuitable. It means that the child must have a toothbrush to bring; it means that he will be taught the best way to use it. And it also means that the dentist will have a clean mouth to work on at the appointment itself. The methods of tooth-brushing that are taught are the same as our own, or only slight variations of them.

4. As I have said before, I believe that the most important single factor in dental health education is the fact that dental clinics are built into the school buildings. This ensures the "routineness" of dental treatment and makes for a high degree of co-operation between teaching and dental staff. It obviates the loss of time caused by failed appointments; if a child is ill another one can be obtained to fill its place.

5. Routine instruction should be given in the schools on the subject of the importance of dental health and oral hygiene. This instruction should be given not only by the dentists and hygienists, but by the school-teachers, as part of the school curriculum.

6. In addition to the children, routine education must also be given to expectant mothers, and this takes place all over the Scandinavian countries in the ante-natal clinics. Special dental courses are arranged for health visitors, and some countries have specially trained dental health visitors.

7. As an additional incentive, and to maintain the ingrained dental consciousness, dental propaganda should be undertaken. Probably the best medium for this is the press, and the propaganda or educational function of this

should be played down, and the items presented as facts of general interest. Women's journals are very suitable for this purpose, as well as daily and local newspapers. Posters and pamphlets are also useful, and should be available for waiting-rooms in medical and dental clinics. Television is a very profitable vehicle for education and it was gratifying to see Mr. Horsnell's recent programme.

If a unanimity of interest exists between the dental profession and a commercial organization it should be exploited, on the lines of the milk products distributors in Norway, and certain toothpaste manufacturers in this country.

In conclusion I should like to thank everybody concerned in arranging for me such an interesting and instructive trip—Messrs. Gibbs for the idea and the money; this society for sponsoring the project; and all the many friends I made in Scandinavia, for their tremendous help and hospitality while I was there. It would be a great mistake for me to mention names, because so many were concerned, but I owe particular thanks to Professor Pedersen, who was extremely helpful in planning the organization and route of the trip.

I hope this Travelling Scholarship will be the first of many.

DENTAL BOARD OF THE UNITED KINGDOM

*Chairman's Address at the Opening of the Sixty-Third Session
on November 12, 1952*

GENTLEMEN,

The dental profession will long remember our late colleague Mr. R. G. Heegaard Warner, who died on Sept. 14. For over half a century he had been associated with dentistry and for most of that time had played an important part in our corporate affairs with conspicuous ability and complete absence of self-interest. It is little more than twelve months since ill health brought to a premature close his association with this Board, of which since 1946 he had been a most sedulous member and Treasurer. He was a man of catholic interests and sympathies, whose breadth of outlook informed many of our activities and proved as valuable to us as his financial perspicacity. He left his memorial behind him not only in the highly satisfactory state of the Board's resources at a time of widespread financial stringency but in the hearts of his colleagues both here and in the British Dental Association, which he served so long and so faithfully in peace and guided with such single-minded devotion in war. We hoped when he retired from the Board that he might recover strength to enjoy the leisure he had earned many times over and knew so well how to employ, but it was not to be. We mourn the loss of a colleague whom we held high in affection and esteem.

When last we met in May there seemed to be every prospect that if we were to meet again it would be merely to attend the obsequies of the Board and arrange its ashes so that the new Council, like the phoenix, might most conveniently arise therefrom. When, however, Parliament was prorogued on Oct. 30 the Dentists Bill had not gone beyond its first reading in the House of Commons, although it had, with some amendments, passed the House of Lords and it must accordingly be renewed as if it were being introduced for the first time. There appears to be no relaxation in the competition for Parliamentary time and we must no doubt be prepared for yet another interval of partially suspended activity before effect is given to the recommendations

made seven years ago by the Interdepartmental Committee on Dentistry. These seven years have witnessed great changes in the organization of the health services in this country and have in many respects increased the need to bring the Dentists Acts up to date.

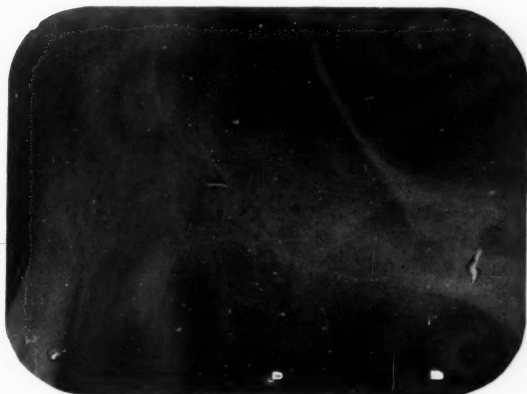
The title to dental treatment conferred upon all who can obtain it by the National Health Service Acts appears to have placed a strain on the dental profession which they are unable to sustain and at the same time lavish that increasing care and attention on the priority classes which alone would make a really constructive contribution to raising the standard of dental health of the whole community.

These measures raise in an acute form problems of manpower and education in dentistry which have been looming on the horizon for years, indeed they were very much in evidence when the Act of 1921 was being discussed. In retrospect it would appear that the Board, with the composition laid down in that Act, was the best body to meet the exigencies of those days. Under the Board's influence the profession has grown and the number of graduates has increased from 5,000 to over 11,000. Their care for education, though it cost the profession over half a million pounds, has proved wise and was in the best tradition of a liberal profession, and I do not believe that any member who contributed to the cost of that achievement would on reflection begrudge his share. I believe that the proposed composition of the Dental Council, which follows closely that recommended by the Interdepartmental Committee on Dentistry and by both this Board and the General Medical Council, will prove to be equally appropriate to the tasks which the Bill in its amended form lays upon that Body.

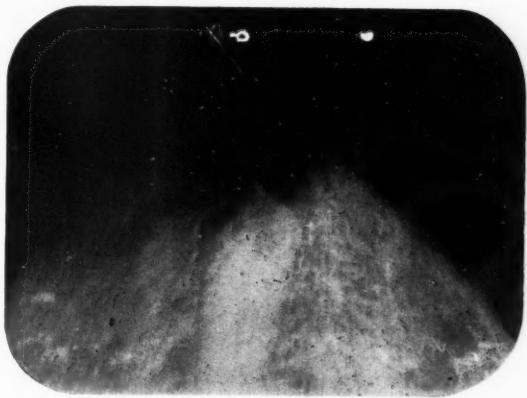
I believe too that the sooner they can get to work the better it will be, both for the dental health of the nation and for the prestige of the profession. We must hope that the delay will not be unnecessarily prolonged.

RADIOGRAPHIC CHART No. 7.

THE DIAGNOSIS OF BURIED ROOTS



A



B

Buried roots may be a constant source of trouble to a patient, as well as leading to a possible seriously infected area. A radiograph is usually the only means of detecting them, and their removal is essential.

A, Buried root of 4; B, Buried root of 3.

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Meanwhile, since the responsibility of the Board to foster dental education and research and to provide bursaries for dental students by collecting and disbursing money has been almost entirely assumed by other bodies, including the University Grants Committee and the Medical Research Council, a great reduction has taken place in the volume of the business which stood referred to our Educational Grants and Education and Research Committees. It has therefore been agreed that in order to make the most economical use of members' time these two standing committees, after thirty years of useful activity, should cease to exist and that the duties referred to them by Standing Orders should be transferred to a new Education Committee. The new committee, with a membership of eight, met for the first time in May of this year.

This same relief from some of their responsibilities naturally affected the Board's finances. At the beginning of the war their programme had inevitably been drastically curtailed and the retention fee had accordingly been reduced from four pounds and finally fixed at two guineas. When the war was over the transfer of functions to other bodies enabled the Board to fulfil their duties without any increase in the fee. At our last meeting, however, the Finance Committee informed us that after five years of steadily increasing costs it was no longer possible, even with the very circumscribed expenditure on public purposes connected with our profession to which we are now committed, to continue on our present income. Their recommendation that the fee should be increased to two pounds ten shillings was adopted by the Board; the consequent amendment of the Regulations has been approved by the General Medical Council and the Privy Council and the new fee is payable for retention in the register during the coming year.

Prominent amongst the public matters related to dentistry with which we are still concerned has been the dental health education of the public. We have recently made a cinematograph film in colour for use in schools. This was needed to replace those of the Board's films which had become obsolete, and it has proved to be a considerable undertaking. Now that it has appeared, under the title "Thirty-two of Her Own", I am sure that the Dental Health Education Committee would wish me, on behalf of the Board, to convey our warmest thanks to the Advisory Committee on Dental Health Education, and particularly to the small subcommittee who, under Dr. Wynne, have been directly responsible for its production. The film is the principal part of an educational "unit" which will include also a repetitive length of film on tooth-brushing, a booklet and a number of film strips on the nature and care of teeth, all linked to the main film. Some of these have already appeared or are nearing completion and when all are ready there should be no room for doubt that we have here an up-to-date and valuable means of instructing young people in the care of their teeth.

The exigencies of the calendar require that in May, 1953, the General Medical Council should meet a week earlier than is customary and, since sufficient interval is required between the meetings of the two bodies to enable the Board's reports to be prepared and circulated to members of the Council, you will be asked during the present session to approve a motion for the suspension of Standing Orders to enable the Board to assemble for general business on the first Tuesday, instead of on the second Tuesday, in May next year. Nothing else in the programme which has been sent to us calls for any comment from me at this point and we may accordingly turn to the dispatch of the business before us.

BOOK REVIEW

OLD INSTRUMENTS USED FOR EXTRACTING TEETH. By Sir FRANK COLYER, K.B.E., LL.D., F.R.C.S. $5\frac{1}{2} \times 8\frac{3}{4}$ in., Pp. 245 with 283 illustrations. 1952. London: Staples Press. 42s.

WE are apt to take for granted the efficient and scientifically designed instruments available to-day for the extraction of teeth. These, together with the development of anaesthesia, have made the ordeal of tooth extraction a painless, if not yet a pleasant, procedure. Some conception of the horror of the process in former times can be gained from this fascinating book. A scholarly work, well and profusely illustrated, it will undoubtedly take its place as a classic in dental historical literature. Sir Frank traces the development of the various types of instrument, most of which are now completely obsolete, from Ancient Grecian

times to the nineteenth century. The pelican, the key, and the screw are now of historical interest only, but before passing out of use had developed many and complex forms: veritable engines of destruction.

The two modern extraction instruments—the forceps and the elevator—have, in fact, been used since the time of Albucasis (1050–1122) and again have been made in many and varied forms, some very ingenious and complex.

The illustrations in this book must undoubtedly compose the finest collection of its kind in world dental literature, and are of the greatest interest to all connected with the practice of dental surgery.

All proceeds from the sale of the book will go to the Benevolent Fund of the British Dental Association.

OFFICIAL SUPPLEMENT OF THE
**SURGICAL INSTRUMENT MANUFACTURERS'
ASSOCIATION (INC.)**

DENTAL LABORATORIES SECTION

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Editorial Committee: D. M. BEAUCHAMP; H. J. POTTER, F.I.B.S.T.

EDITORIAL

**... SO MAHOMET CAME
TO THE MOUNTAIN**

IT was unfortunate for our professional and national prestige that, owing to the short notice at a holiday period, the expense, and the distance, we were unable to send a delegate to join with the Belgians and Italians



French and English presidents meet. Mr. Emmett greeting M. Duvaudie (*Vice-President*), M. Drouhin (*President*), and M. Perrot (*Secretary*), on their arrival from Paris.

at the French Laboratory Owners' Congress at Nice last August.

Short notice and distance did not deter three French leaders from a journey to London, at the prospect of exchanging personal greetings and engaging in an informal talk with those who voluntarily work for, and

represent, the ethical dental laboratories in this country.

Experience of this bilingual conference indicates that in countries where dental laboratories are organized to any extent, we may expect to find that the ideals as well as the problems are similar to our own, and confirms the pronouncement of the president of the laboratories on the other side of the Atlantic, "to-day the ethical laboratories are all thinking alike".

Yet another much needed educational-social-technical assembly has been added to the list of past S.I.M.A. activities. We refer to the table demonstration at Norbury. The subjects dealt with show how extensive is the field of interest of those who attended, and how wide the technical field connected with the work of the dental laboratory.

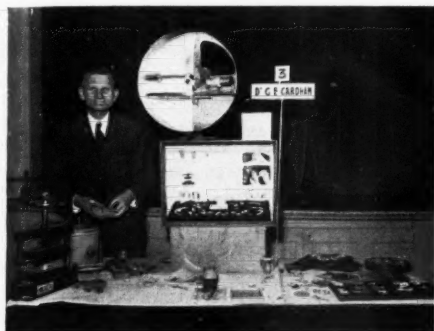
Another opportunity for some to display, and many to view, will be presented next February, when members from all over the country, and possibly men from the U.S. and the Continent, will show samples of their work in varied fields of manual skill and leisure interests.

Our customary Christmas greetings are sent in this issue, with the hope that the festive season will be followed by a more satisfactory and prosperous New Year.

QUANTITY PRODUCTION OF JEWELLERY BY INVESTMENT CASTING

DR. G. E. GARDHAM, Director of the Design and Research Centre for the Gold, Silver, and Jewellery Industries, demonstrated the application of investment casting for the production

patterns can subsequently be withdrawn without damage. As many of these patterns as desired can be made by injecting a suitable wax under pressure into the mould and



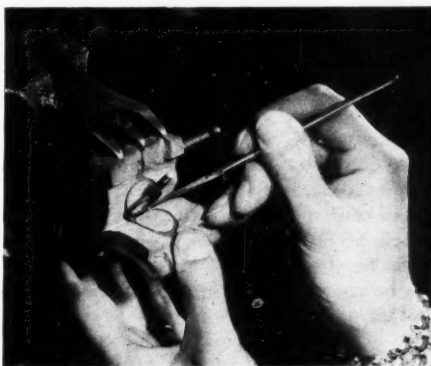
Dr. Gardham showing a wax pattern being taken from the rubber mould: beneath his right hand is the heated wax injector; beneath his left, multiple castings; in the case, intricate wax patterns.



Dr. Gardham explaining how the costume jewellery is centrifugally cast in rubber moulds.

of jewellery to the Croydon Branch on Oct. 24. Although this had nothing to do with dental mechanics, it was of interest in showing the use of a familiar principle in a different field. The jeweller desires to make a number of reproductions of an intricate metal pattern in gold, silver, platinum, or palladium, and must therefore have a means of reproducing the expendable wax pattern. He is less worried than is the dental mechanic by slight dimensional differences, but has usually a much more complex and undercut article to cast. The general method of procedure is as follows:—

The original master pattern, such as a claw ring, is hand-made in metal and a sprue pattern attached at a suitable place. This is then embedded in a block of soft rubber, which is closely moulded around it, and also vulcanized, by heat and pressure in a press. By skilful cutting or "surgery", the block of rubber is then cut into two parts to release the pattern ring and leave a two-part mould with the parting line such that brittle wax



Close-up of extraction of master pattern ring from solid block of rubber by careful surgery.

allowing to cool. The soft rubber can then be flexed away from the solid wax and, in this way, surprisingly intricate waxes can be made in a two-part mould. Numbers of these waxes are then mounted on a base, and invested, taking every care to avoid entrapped air. Although plaster-cristobalite

mixtures are useful for gold and silver, silicophosphate investments are necessary for platinum. The mould is heated in a muffle furnace to melt and volatilize the wax and then inserted in a vertical centrifugal casting machine. The precious metal alloy is melted with a hand blowpipe, fluxed, and cast by releasing the trigger. Up to 5 oz. of metal can be cast in this way. There are also numerous specialist casters who contract to make large articles such as teapot spouts, handles, clock figures, feet and knobs for salvers, and the like.

For the cheaper costume jewellery a simplification of the process is very popular. The metal patterns are used to mould a number of impressions in a pair of rubber disks formed from a heat-resisting or neoprene rubber. The upper disk has a central hole, so that when the two disks are placed on a motor-

driven turntable and clamped down by a suitable cover-plate, they can be spun at about 800 r.p.m. Molten tin alloy at about 300° C. is then poured into the centre of the assembly and is flung by centrifugal force into the impressions, making a very faithful casting. The metal sets quickly and, on stopping the machine, the castings can be withdrawn from the flexible mould even if slightly undercut. Such moulds are relatively cheap to prepare and can be used for 500 to 1,000 shots.

This display was of great interest to all, reviving memories of our youthful interest in this art.

Dr. Gardham had an assurance that our members are not likely to invade the preserves of the manufacturing jeweller to any extent; as heretofore, we will probably confine our activities to the making of our own unhall-marked rings.

NEWS FROM HEAD OFFICE

Our Chairman's Illness.—Our Chairman, Mr. E. G. Emmett, has resumed his normal activities after his operation and we are pleased to welcome him back at the various Committee meetings where he was so greatly missed during his absence.

Demonstration of "Sweden".—Arrangements have been made with the co-operation of Messrs. Henry Courtin & Sons, Ltd., for a demonstration of the quick-curing acrylic "Sweden" on January 22, 1953, and the new Myerson colour film on Dura-Blend Teeth will also be shown. It is hoped that the demonstration will be given by Dr. Rydberg, of Sweden, and we anticipate an interesting and well-supported evening.

Week-end Conference, 1953.—The 1953 Annual Conference Week-end has been arranged to take place during the period of Feb. 13-14. As usual, all the meetings will be held at the Conference Headquarters at the Holborn Restaurant, W.C.1.

The week-end activities open on the Friday with a Reception of members and friends by Mr. and Mrs. E. G. Emmett, and will be followed by the Annual Dinner and Dance in

the Restaurant-Ballroom Suite. Tickets are 28s. 6d. each and can be obtained from Mr. C. M. Booth, 26 Palmerston Road, London, N.22.

On Saturday morning the Annual General Meeting is to be held, starting at 10.30 a.m., and will be followed by an informal luncheon.

The Saturday afternoon is to be devoted to an Exhibition of members' and friends' craftsmanship, and tickets for this can be obtained on receipt of a stamped addressed envelope from Mr. C. M. Booth as above.

Invitations for this Conference of British Dental Laboratory Owners have been sent to their counterparts in Europe, and it is hoped and expected that the contacts so recently made will result in visits by guests from abroad. Indeed the French Fédération Nationale de la Prothèse Dentaire have expressed their intention of attending.

S.I.M.A. Annual General Meeting and Dinner and Dance.—The Annual General Meeting of S.I.M.A. was held at head office on Oct. 10 when reports were presented on behalf of all sections. Mr. Emmett gave a résumé of the activities of the Dental Laboratories Section.

The Dinner and Dance at the Trocadero in the evening was presided over by Mr. H. Guy Drew, the principal guests being Mr. Terence J. Millin, F.R.C.S., and Dr. J. G. Johnstone, of the Ministry of Health. An enjoyable evening was spent by all those present.

Fédération Nationale de la Prothèse Dentaire.

—Some of our London members recently had an opportunity of meeting their French confrères representing the *Fédération Nationale*

de la Prothèse Dentaire who were making a special visit to this country to attend the Croydon Branch Demonstration, and an interesting and useful exchange of views and information took place.

Obituary.—We regret to announce the passing of Mr. H. A. Gregory, of 22, Gt. North Road, Highgate, N.6. We tender to members of his family our deep and sincere sympathy with them in the loss they have sustained.

NEWS FROM THE BRANCHES

London Regional Branch (Report by H. F. Lucas).—A general meeting of this branch took place at 6, Holborn Viaduct, on Thursday, Oct. 2.

Mr. Beauchamp addressed the meeting on the subject of the S.I.M.A. Supplement to the DENTAL PRACTITIONER. A long discussion ensued, with diverse opinions being expressed. Regarding this matter of the Supplement, as well as of other items on the agenda, it seemed to be clear that the present economic state of a number of laboratories is having an effect on the ability of many members adequately to support various activities of the Association financially. In spite of this, it was pointed out that both financial and voluntary personal effort is needed, yet is being neglected.

Croydon Branch.—The fifth demonstration meeting at Norbury Library on Oct. 24 attracted a large number, among whom were travellers from Guildford, Leicester, and Birmingham.

The meeting was timed to commence at 7.30, and promptly to the minute arrived M. Drouhin, M. Duvaudie, and M. Perrot, President, Vice-President, and Secretary of the French laboratory association. Each wore on his coat lapel a small French flag bearing his own name, so as to facilitate identification.

Following a preliminary ten-minute period of renewal of acquaintance, introduction of new friends, and cursory inspection of the seven tables, the chairman, Mr. Beauchamp, made known the presence of the three French friends, and introduced them amid applause.

The demonstrators were then introduced: Mr. P. G. R. King, a teacher in the dental laboratory at Guy's Hospital, and member of the Dental Technology Society; Mr. F. E. Martin, Chairman of London Regional Branch, S.I.M.A., and Fellow of the Institute of British Surgical Technicians; Mr. G. A. Fuller, a technician in a London West End private practice, also a member of the Institute, and whose home is at Hemel Hempstead; Mr. E. M. Natt, the well-known ceramist and photographer; Mr. D. Sober, who had come from Folkestone to represent Messrs. Portland Plastics; Mr. G. M. Gower, an S.I.M.A. member, operating his laboratory in London West End, a courageous man willing to discuss the disadvantages as well as the advantages of his subject; and one who honoured us greatly by his presence, Mr. George E. Gardham, a doctor of philosophy. Dr. Gardham is the Director of Design and Research at Goldsmith's Hall, for the Gold, Silver, and Jewellery Industries.

The meeting then proceeded, following the usual arrangement of seven ten-minute lectures repeated seven times as parties moved around the tables. At 8.55, when the circuit had been completed, to give each speaker a rest the chairman announced the presence of our national president, to whom we all owed so much, who had always journeyed from Edgware to support our efforts, Mr. Eric G. Emmett. Mr. Emmett said how pleased he was to encourage the Croydon committee in their educational endeavours, and as a guest, thanked the branch on behalf of all who

accepted the invitations. He then opened the free-for-all question time. At 9.20 the meeting was closed by the chairman.

We must await more incoming reports before deciding whether those who attended can be said to have *enjoyed* the gathering.

Seven lectureries on such a variety of subjects, ranging from jewellery mass production by investment casting to decorated full upper dentures, packed into seventy minutes, with a twenty-minute questioning time, seems pretty stiff listening, and extremely liable to induce mental indigestion, even in those whose endurance enabled them to remain alert and receptive right through to the end.

It was easier for the lecturers, who were speaking of things of which they had experience and knowledge, but they are to be

sincerely thanked for their trouble taken in preparation, and their information and time freely given.

S.I.M.A. DIARY

(DENTAL LABORATORIES SECTION)

London Regional Branch (Secretary, Mr. R. Foale).—Jan. 15, 6.30 p.m., at 6, Holborn Viaduct. Annual General Meeting. Owing to important issues at stake at the present time, it is urged that all members should make every effort to attend in their own interests.

Birmingham and District (Secretary, Mr. Geo. C. Taylor).—Next meeting, Jan. 7, 7.30 p.m., at Chamber of Commerce, 95 New Street, Birmingham 2.

Croydon (Secretary, Mr. H. J. Nowers).—Annual General Meeting, Jan. 16, 7.30 p.m. sharp, at the Six Bells, Handcroft Road.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS (Dental Section)

THE opening lecture in the 1952-53 series of lectures was given by Mr. R. D. G. Gain, L.D.S. R.C.S., at the Eastman Dental Hospital on Oct. 21 on the subject of "Obturbators".



Mr. R. D. G. Gain giving his talk on Obturbators.

Mr. J. R. Boswell, Chairman of the Dental Section of the Institute, presided over a large audience representative of all sections of the dental profession.

Commencing with the embryology and anatomy of cleft palate, hare-lip, and other associated facial defects, Mr. Gain showed the remarkable improvements obtained in the appearance and function of the unfortunate patients by co-operation between the surgeon, the orthodontist, the prosthetist, and the speech therapist, each with his own group of auxiliaries, with the dental technician as an important part of the prosthetist's team.

The necessity for careful impression taking and surveying, the position and construction of obturbators and dentures for the various types of clefts to produce an adequate closure of the gap and restoration of normal function, and the important contribution made by the dental technician to the comfort and well-being of the patient suffering from defects of this nature were indicated. Mr. Gain illustrated his remarks by a number of slides showing various types of obturbators and the defects they were designed to remove or ameliorate, the condition of the patient before and after surgical treatment, and the provision of suitable devices.

The Committee were complimented by Mr. Potter on behalf of those present for such a promising start to the new season and the Chairman extended to Mr. Gain the sincere thanks and appreciation of all present.